

Historic, Archive Document

Do not assume content reflects current scientific knowledge, policies, or practices.

March

1987

Volume 7, Number 12

Soil and Water Conservation News

United States Department of Agriculture
Soil Conservation Service



USC 22
.56

Soil and Water Conservation News is the official magazine of the Soil Conservation Service. The Secretary of Agriculture has determined that publication of this periodical is necessary in the transaction of public business required by law of this Department. Use of funds for printing *Soil and Water Conservation News* has been approved by the Director of the Office of Management and Budget. *Soil and Water Conservation News* (ISSN-0199-9060) is published 12 times a year. Postage paid at Washington, DC.

Magazine inquiries
Send inquiries to: The Editor, *Soil and Water Conservation News*, Public Information Staff, Soil Conservation Service, U.S. Department of Agriculture, P.O. Box 2890, Washington, DC 20013-2890.

Subscriptions
Send subscription orders to:
Superintendent of Documents
U.S. Government Printing Office
Washington, DC 20402

Comments: From the SCS Chief

Plant Materials Centers—Keys to Conservation's Future

The Soil Conservation Service, at 23 plant materials centers (PMC's) around the country, tests plant varieties for their ability to reduce erosion and sedimentation and help improve water quality. Each PMC unlocks solutions to the most critical conservation problems faced by farmers, ranchers, and other land users in the region it serves.

PMC's are attuned to our national conservation priorities as well as to regional needs. For example, several centers are concentrating on plants that reduce cropland erosion. Centers serving the principal non-irrigated cropland parts of the country have tested more than 4,100 plants for use as cover crops or parts of conservation tillage systems. Centers in California, Montana, North Dakota, and Texas have greatly expanded their efforts on field windbreaks.

To solve a particular problem, PMC's obtain native or introduced plants that show promise. They test and compare plant performance at the PMC and in field trials under actual-use conditions. Then they release their selections to commercial nurseries and seed producers. The centers work closely with commercial firms and seed and nursery associations and with State and other Federal agencies.

Conservation district cooperators show that they value the responsiveness and foresight of the PMC's and see each center's work as a key to future conservation efforts on their own land. They show their support by lending a hand in the final testing. Last year alone, more than 2,900 plantings on cooperators' land helped to determine how well the test plants hold the soil and prosper under everyday use.

In 1986, PMC's nationwide released 12 new plants for commercial production, bringing the total to 258. Of those released before 1986, 181 still are on the market. In 1985, commercial production of SCS releases amounted to 7 million pounds of seed and 9.4 million plants. The retail value was about \$25 million, up \$5.9 million from the year before.

The Conservation Reserve Program increased the demand for many conservation plants. To meet this demand, the PMC's took two significant steps. First, they increased their production of seed and plants to satisfy the needs of commercial producers. Second, they developed a computerized database to help potential customers find the producers of most conservation plants.

In response to users' needs, a new PMC will open this year at Booneville, Ark. It will serve western Arkansas, southern Missouri, and eastern Oklahoma.

The National Plant Materials Center in Beltsville, Md., locates plants from foreign sources and conducts special studies that support the work of the regional centers. The Beltsville center also coordinates our plant materials assistance to other countries. On average, we send 400 plant accessions to researchers in two dozen countries per year.

Our hats are off to this fine effort by the PMC's and our cooperators at home and around the world. Truly, it opens many doors to the future of soil and water conservation.



Cover: On the L7 Ranch in north central South Dakota, Roger Dunn, foreground, manager of the L7 Cattle Co., and Maurice Davis, SCS area range conservationist, examine range grass inside an enclosure, an area fenced off from cattle. Conditions in the enclosure provide a gauge of how heavily the rest of the rangeland is being grazed. (Photo by Tim McCabe, former photographer, SCS, Washington, D.C.)

Richard E. Lyng
Secretary of Agriculture

Wilson Scaling, Chief
Soil Conservation Service

All programs of the U.S. Department of Agriculture are available to everyone without regard to race, color, national origin, sex, age, or handicap.

Editor, Nancy M. Garlitz

Associate Editor, Paul D. Barker

Editorial Assistant, Ann P. Serota

Design Consultant, Christopher Lozos

Reprint permission

Contents of this magazine may be reprinted without special permission. Mention of source is requested. Photos available on request.

Commercial names

Mention of commercial enterprises or brand names does not constitute endorsement or imply preference by the U.S. Department of Agriculture.

SCS Searches Worldwide For Conservation Plants

Many scientists retreat to their laboratories to solve problems. For plant scientists of the Soil Conservation Service, however, the whole world is a laboratory.

SCS plant scientists comb the world for better plants to solve soil and water conservation problems. They know that, over time, Nature has proven very effective at developing plant species capable of surviving some of the most extreme conditions on the planet. So, instead of relying on a laboratory, SCS plant scientists look for these hardy plants in the places where they are already growing.

Some of the grasses, legumes, and woody plants suitable for erosion-control work in this country have been found growing in the most remote areas of the world. Since 1939, SCS plant materials centers have released 264 conservation plants for commercial use, and more than

a third of these have come from foreign sources.

To obtain foreign plant materials and information, the National Plant Materials Center (NPMC) at Beltsville, Md., has established contacts with researchers, scientists, and organizations in more than 100 countries. The NPMC also compiles data on plants and maintains a computerized data base. Special attributes noted by the original collector and other information such as the plant's suitability to different soil types and precipitation and temperature zones are recorded and provided to SCS scientists seeking new plants to solve specific conservation problems.

Every foreign plant being tested by SCS is first brought, usually in the form of seeds, to the NPMC. The NPMC grows small plots of the new plant to increase its supply of seed before sending it out for extended field tests at any of the 23 plant materials centers across the Nation. This enables NPMC personnel to observe the new plant and relay information to other plant materials centers on traits such as potential weediness or susceptibility to insects or diseases.

In addition to acquiring new plants from overseas, the NPMC also acts as the central SCS contact point for both foreign and domestic plant scientists in their search for new conservation plants. Recently, SCS plant materials personnel visited the People's Republic of China, Jordan, West Germany, and Mexico. In return, two delegations from China and one delegation from West Germany visited the United States. This has opened new avenues for the international exchange of plant materials.

The Chinese delegations have expressed a strong interest in developing a plant materials program similar to the SCS operation through further exchanges of plants, people, and information. Such cooperation will help the United States as well as other countries to solve conservation problems with improved technologies and plant materials.

Jim Briggs,
manager, National Plant Materials Center, SCS,
Beltsville, Md.

Jerry Hammond,
director, International Activities Division, SCS,
Washington, D.C.



Fruit from 'Cardinal' autumn olive, an SCS plant release that provides food and cover for wildlife and is useful for stabilizing disturbed areas. SCS received this woody plant from Manchuria in the People's Republic of China.

Photo by Ron Nichols,
photographer, SCS,
Washington, D.C.

SCS Is Looking for a Few Good Plants

The Soil Conservation Service is always looking for good plants to do tough conservation jobs. In 1986, SCS plant materials centers (PMC's) released 12 plants for commercial production that can stabilize streambanks, revegetate mined areas in high elevations, reduce shoreline and cropland erosion, improve vegetation on pastureland, provide protection from wind, and provide food and cover for wildlife.

The plant releases come from years of cooperative testing by PMC's, SCS field offices, and other Federal and State agencies.

Six of the new plant releases come from the PMC in Palmer, Alaska, which is operated by the Alaska Department of Natural Resources with technical assistance from SCS.

One Alaska release is 'Egan' American sloughgrass (*Beckmannia syzigachne*), named for the former governor of Alaska who signed the bill creating the Palmer PMC in 1972. The plant was selected for reclaiming and stabilizing ditches, streambanks, and wet areas and for improving habitat for ducks and geese. The plant is primarily adapted to wet sites and performs well between 60 degrees N. latitude and the Arctic Circle.

Five native willows make up the other Alaska releases. All are fast growing, easy to produce, and well adapted to Alaska's environment. All of the willows are suited for use in stabilizing riparian zones and for use as windbreaks. 'Roland' Pacific willow (*Salix lasiandra*), named for the father of Alaskan agriculture, is also valuable for screening and landscape use, as are two other releases, 'Wilson' bebb willow (*Salix bebbiana*) and 'Long' barclay willow (*Salix barclayi*). These last two were named in honor of Jim Wilson, last territorial commissioner of Alaska, and Waymeth Long, a former SCS State conservationist of Alaska.

'Oliver' barren ground willow (*Salix brachycarpa*), named for William Oliver, another former SCS State conservationist, can be used in landscaping and providing food for browsing wildlife. 'Rhode' feltleaf

willow (*Salix alaxensis*), named for Clarence J. Rhode, former director of the U.S. Fish and Wildlife Service in Alaska, is also valuable for wildlife use.

The other 1986 plant releases can be used to solve a wide variety of conservation problems across the country. One of them is 'Niagara' big bluestem (*Andropogon gerardi*), the first tall-growing, native warm season grass selected specifically for use in the humid, temperate Northeast. 'Niagara' was released by the Big Flats PMC in New York. It is valuable for forage and for erosion control on droughty sites such as gravel mines, strip mines, or roadsides.

'Summit' Louisiana sage (*Artemisia ludoviciana*) is a native plant with strong spreading root stocks. The species occurs in the wild from Canada to Mexico and from the Great Plains to the sub-Alpine areas of the southern Rockies. 'Summit' is valuable for revegetating mine sites at high elevations like the intermountain areas of the West. 'Summit' is a joint release by the PMC in Meeker, Colo., the U.S. Department of Agriculture's Forest Service, and three State agricultural experiment stations.

The Cape May, N.J., PMC has released 'Avalon' saltmeadow cordgrass (*Spartina patens*), a plant for controlling shoreline erosion in the mid-Atlantic States. This cordgrass is used to stabilize the upper tidal zone of bays, tidal rivers, and estuaries from Massachusetts through North Carolina. It can be easily transplanted to these sites, grows rapidly, and produces a protective, sand-catching band of vegetation.

'Gobbler' sawtooth oak (*Quercus acutissima*) is a large, round-headed tree that grows to 70 feet in about 20 years with leaves similar to those of chestnut trees. 'Gobbler' sawtooth oak begin producing acorns when they are 8 to 11 years old and, at maturity, produce 125 pounds of acorns a year. The acorns are choice food for wild turkey, squirrels, and white-tailed deer. The sawtooth oak is a handsome shade or specimen tree. 'Gobbler' can be grown from Florida to Texas and northward to New York. It may be adaptable to some areas receiving more than 30 inches of

annual rainfall. 'Gobbler' was released by the Quicksand, Ky., PMC.

'Ellagood' autumn olive (*Elaeagnus umbellata*) was first observed by Wilmer Steiner, a former SCS national plant materials specialist, while he was living in Newtown Square, Pa. The plants were growing in the yard of a neighbor by the name of Ellagood. Steiner collected the plants in 1965, and after years of evaluation, the area of adaptation was determined to be primarily the southern United States. 'Ellagood' is an extremely late-maturing variety, and the fruit is available for use in late November and December. For high quality fruit production the plants must be started from shoots or slips. 'Ellagood' was released jointly by the PMC's at Americus, Ga., and Coffeeville, Miss.

'Quail Haven' reseeding soybean (*Glycine soya*) provides a haven for quail. As are all soybeans, 'Quail Haven' is an annual, but it reseeds from the previous year's production and can be easily managed to perpetuate itself indefinitely. Its principal use is for food and cover for quail and other wildlife. It can also be used as a hay crop or cover crop for soil improvement. 'Quail Haven' produces about 1,200 pounds of seed per acre for use by birds and other animals. Because it doesn't mature until late October or early November, its area of adaptation is limited to the Coastal Plain of the southeastern United States. 'Quail Haven' was released by the Coffeeville, Miss., PMC.

These 12 new conservation plants join the almost 200 other SCS plant releases being commercially produced. SCS recommends use of the plants to farmers, ranchers, and other landowners to solve a wide range of resource conservation problems.

Curtis Sharp,
national plant materials specialist, SCS,
Washington, D.C.

Plant Release Fills Gap in Forage Production

The main production seasons for the principal pasture grasses in the Northeast are spring, early summer, and fall, but cattle need forage in midsummer as well.

A new plant released jointly by the U.S. Department of Agriculture's Soil Conservation Service and Agricultural Research Service (ARS) and Pennsylvania State University provides forage in midsummer, reducing the need for supplemental feed.

Northeast cattle producers can use 'Niagara' big bluestem (*Andropogon gerardi*), released in 1986, to supplement the commonly grown cool season forage grasses, which include orchardgrass, brome grass, timothy, and Kentucky bluegrass. Originally collected near Buffalo, N.Y., 'Niagara' is adapted to the eastern United States, as far south as Tennessee and North Carolina, and west to Missouri.

In adaptation studies, 'Niagara' big bluestem even outyielded cool season grasses. The plant grows back quickly after grazing and has no significant disease problems.

ARS Research Agronomist Gerald Jung with the Research Pasture Lab at University Park, Pa., reports that 'Niagara' big bluestem outyielded and was more persistent than Midwest varieties.

'Niagara' has an extensive root system and can tolerate soils with a low moisture-holding capacity and a low level of phosphorus. It can also tolerate highly acidic soil conditions. These characteristics make 'Niagara' big bluestem a good plant to use for controlling soil erosion and revegetating droughty sites such as gravel mines, strip mines, or roadsides. For erosion control, it can be planted alone or in mixtures with other warm season grasses.

When located near complementary habitat, 'Niagara' big bluestem provides quality nesting cover for birds and is used by mammals for loafing and escape routes.

John Dickerson,
plant materials specialist, SCS, Corning, N.Y.

Martin van der Grinten,
manager, plant materials center, SCS, Corning, N.Y.



A 1986 SCS plant release, 'Niagara' big bluestem, provides mid-summer forage in the Eastern United States. 'Niagara' will be especially useful to livestock producers who use a rotational grazing system like the one in the top photo, where cattle are moved frequently among pastures. Above, cattle graze in a pasture that is part of a rotational grazing system in New York.

Photos by Karen Rusinski, audiovisual production specialist, SCS, Albany, N.Y.

Native Prairie Grasses Take a Stand

Native prairie grasses of the American Midwest are being brought back to protect their homeland.

The tall-grass prairie was once host to many ground-nesting wildlife species and several large herbivores such as deer, elk, and buffalo. Beginning with the early settlers, however, the fertile prairie soils were plowed and converted to the production of small grain and introduced forage species. Intensive year-round use by domestic livestock and the steel plow led to increased soil erosion and the disappearance of the native prairie grasses.

Today, farmers, researchers, and conservation agencies realize the value of the native prairie grasses for pasture, hay, wildlife, and commercial uses. Assisted by seed growers and State and Federal programs—including the new Conservation Reserve Program of the U.S. Department of Agriculture (USDA)—farmers have planted thousands of acres to native prairie grasses.

Three cultivars that have been planted extensively in the past few years are

'Cave-In-Rock' switchgrass, 'Rumsey' Indiangrass, and 'Rountree' big bluestem. These cultivars were released as conservation plants by the Soil Conservation Service's Elsberry, Mo., Plant Materials Center (PMC) and the University of Missouri Agricultural Experiment Station to provide quality summer forage and wildlife cover and stabilize critically eroding areas. The Elsberry PMC has developed several techniques to improve seed handling of these grasses and to reduce the time needed for establishment.

Commercial growers have been working closely with farmers, researchers, and government agencies throughout the eastern half of the country to promote the use of these and other native grasses. They are assisting in research projects and informational programs and sharing stand-establishment technology.

With its emphasis on retiring marginal cropland from production and planting it to

permanent vegetation, USDA's Conservation Reserve Program (CRP), which was established by the Food Security Act of 1985, has provided an excellent opportunity for landowners to establish native grasses. A significant portion of the CRP acreage in the Midwest is being planted to native grasses and, under the terms of the program, will be kept in the new cover for at least 10 years.

State programs have also been active. Over the past 7 years, the Iowa Conservation Commission has provided cost-sharing assistance to 350 landowners for establishing more than 6,000 acres of switchgrass for hay and pasture. The Missouri Department of Conservation has furnished rangeland drills free of charge for the planting of about 10,000 acres over the past 10 years. The Illinois Department of Conservation is planting native prairie grasses on State lands and is making seed of local strains available to private landowners.

Cost sharing for establishing native grasses has also been available through



'Rountree' big bluestem, at left, is one of the warm season native prairie grasses returning to the Midwest with the help of farmers and other land users.

Above, Richard R. Brown, retired SCS plant materials specialist, inspects a stand of 'Rumsey' Indiangrass, another native prairie grass, at the SCS Elsberry, Mo., Plant Materials Center.

Photos by Charles Rahm, public affairs specialist, SCS, Columbia, Mo.

SCS Computers to Locate Plant Sources

USDA's Agricultural Stabilization and Conservation Service. Local soil conservation districts have helped administer several State cost-sharing programs.

To meet the increased demand for seed, commercial growers have rapidly increased production. Current annual commercial seed production is estimated at about 150,000 pounds of 'Cave-In-Rock' switchgrass, 50,000 pounds of 'Rountree' big bluestem, and 10,000 pounds of 'Rumsey' Indiangrass. This is enough to plant about 40,000 acres.

As the use of these native grasses increases, the Elsberry PMC is increasing its production of foundation seed to meet the increased needs of the growers. The result will be more seed for the growers, more seed for the farmers, and more native grasses protecting the prairie soils of the Midwest.

Richard R. Brown,
retired plant materials specialist,
SCS, Columbia, Mo.



Ever know what you needed but didn't know where you could buy it?

In this respect, farmers and ranchers who apply conservation practices are like most other people. Finding what they need can be a time-consuming and frustrating activity.

The things they frequently need are conservation plants. More than half of the conservation practices recommended by the Soil Conservation Service involve plants. Because of their specialized nature, however, conservation plants and seed are not always available at local seed stores. As a result, not only does SCS help find and develop the plant species best suited for conservation work but also encourages commercial growers to produce and market the seed and helps landowners locate retail outlets for the seed they want.

Over the years, many State offices of SCS kept lists of the vendors in their State who sell the different conservation plants and seed. General economic trends and changing supplies and demands, however, often made these lists out of date by the time they were printed and distributed.

In 1985, SCS began a nationwide computerization of vendor information. First, a database named PMSOURCE was developed on the Univac computer at the U.S. Department of Agriculture's Fort Collins, Colo., Computer Center. Then a user-friendly, menu-driven prompt program was written that will enable most SCS offices to obtain data from the database.

Field plant materials specialists and others are currently preparing data for inclusion in PMSOURCE, an operation being coordinated by SCS's South National Technical Center at Fort Worth, Tex. All SCS State offices have been encouraged to submit data about the conservation plants they recommend. Thus far, data has been entered pertaining to 130 vendors and 226 plants.

The PMSOURCE database can provide the user with different types of reports, depending on whether the user is working with common plant names, scientific plant names, or plant symbols and wants the names of all vendors in the country or in just one State. For example, a report on sources in the country for indiangrass yields the name, address, and telephone number of six seed companies in four different States where indiangrass can be bought.

The data bank will eventually be made available to all interested users at a cost of less than \$3 for each report. Most users will probably access PMSOURCE only once or twice a year to get the reports most needed for their operations. Users can then store the data in office computers, such as the Field Office Communication and Automation System equipment being installed in SCS offices, and then use and update the data as necessary.

Information on accessing PMSOURCE is available from SCS plant materials specialists. More complete information will be distributed soon in an SCS National Plant Materials-Information Resource Management Handbook.

H. Wayne Everett,
plant materials specialist, South National Technical
Center, SCS, Fort Worth, Tex.



Gary Fine, manager of the SCS plant materials center in Manhattan, Kans., examines a new form of eastern gamagrass.

Good News on Eastern Gamagrass

The story of eastern gamagrass is a mixture of good news and bad news, and the good news is getting better, thanks to the efforts of the Soil Conservation Service's plant materials center (PMC) in Manhattan, Kans., and Kansas State University.

Eastern gamagrass (*Tripsacum dactyloides* L.) is a native warm season perennial grass adaptable from Kansas to the east coast. It grows in clumps from 1 foot to 4 feet in diameter and reaches 5 to 9 feet in height. It is excellent forage, highly palatable to livestock, and highly productive.

The bad news first. Heavy grazing by livestock has caused eastern gamagrass to almost disappear from most pastures and rangeland in the Midwest and the Eastern United States. The plant is killed when extensive grazing or hay cutting reduces top growth below 8 inches in height for an extended time. Making matters worse, eastern gamagrass is a poor seed producer and seed dormancy is high. Without special treatment, first year germination rates are often less than 10 percent.

The seed heads of eastern gamagrass resemble corn tassels. The heads usually have one to three spikes, which contain

The SCS Plant Materials Center in Knox City, Tex., develops conservation plants suited to conditions in Texas and Oklahoma. It also provides foundation seed to commercial growers. Here, and elsewhere across the country, extensive grass, tree, and wildlife plantings under the new Conservation Reserve Program have increased the demand for the most popular conservation plants.



Seeds are Central to Conservation Reserve

The new Conservation Reserve Program (CRP) administered by the U.S. Department of Agriculture under the Food Security Act of 1985 has not only increased the demand for seed by farmers and ranchers, but also for foundation seed by commercial seed producers who use it to grow seed crops.

Last year, as farmers began converting millions of acres of marginal cropland to grassland and woodland under the CRP, seed supplies began to dwindle in some parts of the country. To produce more

multiple spikelets. The lower spikelets contain female florets, and the upper spikelets contain male florets. This characteristic greatly limits seed production, making it impractical to produce commercially.

The good news is that a deviant sex form of eastern gamagrass was discovered at the Manhattan, Kans., PMC that could greatly improve the seed production lines of eastern gamagrass.

The seed heads of the deviant plant have female florets below and perfect florets (having both male and female parts needed for seed production) above. All spikelets contain two functional pistils. This results in a 20- to 25-fold increase in seed set compared to normal plants. But, while this unique form of eastern gamagrass is a good seed producer, it is a poor forage producer and susceptible to leaf rust.

Looking for the right combination, Gary Fine, manager of the PMC in Manhattan, Kans., and Frank Barnett, a plant breeder at Kansas State University, and others are working on crossing the deviant plant with eastern gamagrass plants that are high forage producers. Successful breeding could lead to high forage producing hybrids suitable for commercial seed production.

John T. Nicholson,
plant materials specialist, SCS, Salina, Kans.

Raising Livestock on Peanuts

When you ask most people which animals eat peanuts, they usually say monkeys or elephants. Thanks to two recent plant releases, cattle are dining on peanuts, too, although in a different way.

Cattle in peninsular Florida are grazing on the foliage of two perennial peanut plants, 'Florigraze' and 'Arbrook.' The first was released for commercial production in 1978, and the second was released in 1985. Both were released jointly by the Soil Conservation Service's Brooksville, Fla., Plant Materials Center (PMC) and the University of Florida at Gainesville.

Livestock producers in peninsular Florida have long sought a high quality forage legume to reduce supplemental feed costs. Annuals grown farther north do not reseed dependably in the area's dry winter, and the subtropical warm season annuals do not make quality hay.

Perennial peanuts were introduced to the United States from South America by the U.S. Department of Agriculture's Agricultural Research Service in 1936. SCS plant materials personnel and University of Florida scientists found that the plants produce high quality forage and are persistent under grazing.

Because the plants do not produce nuts, an alternative propagation method was

needed. The peanuts spread by rhizomes, and a commercial bermudagrass sprig digger is used to dig up the rhizomes and shake the soil off. A sprig planter is used to place the rhizomes in the ground at the proper rate and depth.

'Florigraze' has fine roots and dense foliage and responds quickly after grazing or clipping. It produces 6 tons of dry forage per year, half of it in midsummer. 'Florigraze' is adapted to well-drained soils but not the excessively drained sands of the central Florida ridge.

'Arbrook' perennial peanut is taller and grows deeper than 'Florigraze.' 'Arbrook' produces the same total amount of forage but produces half of it in the dry spring, making it a better hay crop.

Using both cultivars, livestock producers have one to use for making hay for winter and one for their cattle to graze in summer. Perennial peanut is accepted by dairy and beef cattle, goats, horses, sheep, and rabbits.

Cool season annuals can be over-seeded into perennial peanuts without damaging the stand to get year-round use of the land. Above all, perennial peanuts are perennial, and stands have persisted for over 30 years at low rates of fertilization.

Robert J. Glennon,
plant materials specialist, SCS, Brooksville, Fla.

seed, seed associations and commercial seed suppliers increasingly turned to plant materials centers (PMC's) of the Soil Conservation Service for foundation seed. The PMC's maintain, as necessary, genetically pure foundation seed for conservation plants.

In February 1986, before the first CRP signup, the technical committee of the PMC in Knox City, Tex., became concerned about the availability of seed for the new program. About 20 percent of the 40 million acres of cropland to be placed in permanent vegetation over the next

5 years is expected to be in Texas and Oklahoma, the area served by the Knox City PMC.

It was obvious to the committee members that seed producers could not meet such a demand without increased production. To increase production, there would have to be more foundation seed available.

The committee decided to increase production of five species. In May, technicians at the PMC planted seven more acres to 'Comanche' partridge pea, 'Mas-on' sandhill lovegrass, 'Selection 75' kleingrass, 'Aztec' Maximilian sunflower, and 'Alamo' switchgrass. Increased demand is also expected for foundation seed of 'Eldorado' Engelmann daisy, 'T-587' old

world bluestem, 'Lometa' Indiangrass, 'Haskell' sideoats grama, and 'Sabine' Illinois bundleflower, but supplies at the PMC appear adequate for these species.

The Knox City PMC now has enough foundation seed of the most popular species to put 1,250 more acres into seed production. If seed growers plant these new acres in 1987, the increased production should go a long way toward meeting the planting needs of the CRP in Texas and Oklahoma through 1990.

James S. Alderson,
manager, plant materials center, SCS, Knox City, Tex.

I N D E X

Community Resource Planning

Birds, Bees, and Other Wildlife (Ind.). Wayne Machan, July, p. 8.
Building a New Housing Industry (N.Y.). Tony Esser, June, p. 3.
California Volunteers Head for the Hills to Seed Burned Slopes. Sheryl Mitchell, Oct., p. 6.
Converting Sawdust to Gas (Mo.). James Callahan, June, p. 4.
Developing the Missouri Bootheel. James Callahan, June, p. 6.
Financing a Rural Water Project (Iowa). Dale Kraus, July, p. 4.
Forming Haygrower Groups (Iowa). Lynn Betts, June, p. 7.
Fresh Start at Old Problem (Ga.). Gary Tyre and Ronald Barton, July, p. 7.
Good Grounds for a Better Community Center (S.C.). David White, July, p. 5.
Illinois Takes New Approach to Resource Planning. David Moffitt, Nov., p. 6.
Linking New England and the Canadian Maritimes (Maine). Thomas Sweetser, June, p. 4.
Marketing New York Beef. Dale Clark and Jean Krebs, June, p. 8.
Meeting the Demand for Wildrice (Idaho). Gerald Johnson, June, p. 6.
Park Visitors See Conservation in Action (Pa.). Frederick Bubb, July, p. 9.
Preserving Woodland Eases Flooding Problem (S.C.). David White, July, p. 6.
Prisoners Put Farmland Back into Production (Maine). Norris Braley, July, p. 7.
Promoting Vermont. Ann Dudas, June, p. 7.
RC&D: Making Things Happen. Ron Page, June, p. 3.
RC&D: The Rest of the Story. Ron Page, July, p. 4.
Shop Students Build Nesting Boxes (N.C.). J.W. Busick, July, p. 9.
Study Steers River Use (Maine and N.H.). William Branigan, July, p. 6.
Town Is Mindful of Future Water Needs (R.I.). Philip Morneault, July, p. 4.
Trying New Crops in Iowa. Lynn Betts, June, p. 5.

Conservation Education and Youth

Agriculture Goes to Class (Nebr.). Ellen Hellerich, Feb., p. 6.
Annual Land, Pasture, and Range Judging Contest Held in Oklahoma. Dwain Phillips, Oct., p. 9.
Carnival Proves A Winner (Miss.). Jeannine May, Feb., p. 4.
Comments From the SCS Chief. Conservation Education—An Investment in the Future. Feb., p. 2.
Conservation Education Award Winners. Ronald Francis, Feb., p. 3.
Down on the Farm (Utah). William Robinson, Feb., p. 7.
From the Mountains to the Sea (S.C.). Neil Bartley, Feb., p. 9.
Girl Scouts Catch the Spirit! (Idaho). Sharon Norris, Feb., p. 8.
Helping Teachers to Teach Soil and Water Conservation (Kans.). Terry Buettgenbach, Oct., p. 10.
Indiana Conservation District Takes Conservation Education on the Road. Melvin Womack and Mary Cressel, Oct., p. 11.
Landfests in Oregon. Shirley Boothby, Oct., p. 10.
Learning on the Land (Mont.). Tammy Muller, Feb., p. 10.
Learning Outdoors (Okla.). Dwain Phillips, Feb., p. 5.
Learning Who Cares About Conservation Education (Fla.). Feb., p. 11.
Little Tree Planters, Big Tree Finders (N.Y.). Jean Krebs, Feb., p. 10.
Minnesota Hosts Ag-Stravaganza. Kathy McRae, Feb., p. 12.
Nature Camp Attracts Kentucky Teachers. Ann Seppenfield, Feb., p. 11.
New Curriculum Rule for Minnesota Schools. Feb., p. 9.
New USDA Program Helps to Put Ag in the Classroom. Oct., p. 11.
Sharing Ideas. Feb., p. 10.
West Virginia Program Supports Learning About the Environment. Steven Feese, Feb., p. 12.

Conservation Tillage

Farmer Is Key to No-Till Success (Mont.). Larry Robertson, Apr., p. 4.
Farmers' Use of Conservation Tillage Still Growing. May, p. 6.
Indiana Study Shows Birds Prefer No-Till. James McCall, May, p. 9.
Maine Farmers Respond to No-Till Challenge. Robert Halbohm, Apr., p. 3.
Ohio State Begins Conservation Tillage Program. July, p. 11.
Ridge-Tillage Up in Corn Belt. Jan., p. 11.
Save-a-Trip, Save Soil (Iowa). Jody Christiansen, July, p. 10.

Emergency Assistance

SCS Provides Emergency Flood Assistance in New Jersey. Barbara Maus, Nov., p. 10.
West Virginia Flood. Jim Thorn, Jan., p. 6.

Energy Conservation

Converting Sawdust to Gas (Mo.). James Callahan, June, p. 4.

Environment

Conservation Highlights 1985. Apr., p. 7.
TVA Launches Journal. July, p. 10.

Erosion Control

Camptown Pulls Ahead in Race Against Streambank Erosion (Pa.). Michael Lovegreen, Nov., p. 4.
Farm Family Takes Stand Against Soil Erosion (Ala.). James Smith, Sept., p. 11.
Seed Corn Growers Concerned About Wind Erosion (Mich.). Alan Herceg, Oct., p. 8.

Farmland

Bidding for the Future: The Conservation Reserve. Compiled by Paul Barker, Sept., p. 8.
Combining Practices to Save Soil and Water (Tex.). Dale Allen, Aug., p. 6.
Comments From the SCS Chief. 1985 Conservation Provisions Based on RCA. Jan., p. 2.
Comments: Guest Editorial. Getting the 1985 Farm Bill on the Land. Peter C. Myers, Sept., p. 2.
Conservation Practices Help Vineyards Adapt to High Plains (Tex.). Dale Allen, Aug., p. 7.

CRP—Good News for Minnesota Farmers. Paul Barker, Dec., p. 6.
Districts Help Meet CRP Needs (Okla.). Dwain Phillips, Dec., p. 10.
Going, Going, Saved (N.J.). Barbara Maus, Jan., p. 10.
1985 Food Security Act—What Does It Mean? Sept., p. 3.
Pilot Projects Succeed in Land Use Conversion. David Sawyer, June, p. 11.
Reinvest in Minnesota. Dec., p. 9.
USDA Issues Rules for Highly Erodible Land and Converted Wetlands. Sept., p. 10.

Flood Control

Flood Control Project Passes the Test (Minn.). Paul Barker, Jan., p. 5.
Floods on Canby Creek, Now a Thing of the Past (Minn.). Paul Barker, Jan., p. 4.
Illinois Inventories Urban Flood Damage. Keith Donelson, Jan., p. 11.
State Floodplain Managers To Hold Conference. Apr., p. 6.
West Virginia Flood. Jim Thorn, Jan., p. 6.

Great Plains

Conservation Helps Rancher Survive Drought (Mont.). Matthew Ricketts, Oct., p. 7.
Range Improvements In Montana Foothills. Wendell Martinell, Nov., p. 8.

International Activities

SCS Searches Worldwide For Conservation Plants. Jim Briggs and Jerry Hammond, Mar., p. 3.

Irrigation

Farmers Pool Resources, Survive Drought (S.C.). Robert Bowie, Dec., p. 11.
Improved Irrigation Protects Water Supply (N.Y.). Allan Connell and Jean Krebs, Oct., p. 4.
Irrigation Associations Co-Sponsor Conference and Exposition. Oct., p. 7.
Nevada Farmers Make Irrigation Systems Work Smarter. Nancy Garlitz, June, p. 9.

Private Businesses Help Promote Improved Irrigation (Nebr.). James Benson, Jan., p. 8.
 Skategate Rolls Down Irrigation Costs (Colo.). Jerry Schwien, Jan., p. 9.
 Surge Irrigation Guide to be Published. Swayne Scott, July, p. 10.

Management

Accelerated Land Treatment Benefits Southern Idaho Watershed. M. Ron Davidson and Travis James, Aug., p. 4.
 Basics Emphasized in Mississippi. Larry Milner, Aug., p. 9.
 Bidding for the Future: The Conservation Reserve. Compiled by Paul Barker, Sept., p. 8.
 Comments From the SCS Chief. Cooperation Keeps Conservation Tillage Growing. June, p. 2.
 Comments From the SCS Chief. Helping Farmers Prepare for the Future. Nov., p. 2.
 Comments From the SCS Chief. Helping Small Family Farm and Ranch Operators Conserve Soil and Water. Apr., p. 2.
 Comments From the SCS Chief. Improving Our Ability to Measure Soil Erosion. Oct., p. 2.
 Comments From the SCS Chief. The Soil Conservation Service—A Tradition of Excellence. May, p. 2.
 Comments From the SCS Chief. Volunteers—An Invaluable Resource. July, p. 2.
 Comments: Guest Editorial. Getting the 1985 Farm Bill on the Land. Peter C. Myers, Sept., p. 2.
 Conservation Assistance for Three Typical Farms. Apr., p. 5.
 Control the Splash. Nov., p. 11.
 District Provides No-Till Equipment and Rebates (Pa.). Fred Suffian, Apr., p. 6.
 Districts Help Meet CRP Needs (Okla.). Dwain Phillips, Dec., p. 10.
 Forum Held on the Future of Agriculture. May, p. 5.
 Free Seedlings Valued by District (Okla.). Stephen Tullar and Hilda Culver, Aug., p. 9.
 Iowa Study Shows High Off-Site Costs of Soil Erosion. Lynn Betts, Nov., p. 10.
 Lights, Camera, No-Till! (Mont.). Paul Barker, Aug., p. 8.
 Looking Ahead with RCA. Paul Barker, Jan., p. 3.
 NACD Holds 40th Convention. May, p. 3.

New England States Strengthen Volunteer Program. July, p. 3.
 1985 Food Security Act—What Does It Mean? Sept., p. 3.
 Rain Simulator Built for Display (Iowa). Lynn Betts, Apr., p. 5.
 SCS Compiles Sample for Landowner Survey. May, p. 5.
 SCS Goes to CAMPS. Nancy Garlitz, Dec., p. 5.
 SCS to Revise Guidelines on Designing Open Channels. Donald Clarke, Nov., p. 9.
 SCS Warns of Cave-in Hazards (Tex.). Dale Allen, Aug., p. 8.
 Speaking Tips for Volunteers. July, p. 3.
 State Floodplain Managers To Hold Conference. Apr., p. 6.
 The Universal Soil Loss Equation—Where It Came From, Where It's Going. Nadine Pitts, Oct., p. 3.
 USDA Accepts 5 Million More Acres into Conservation Reserve. Nov., p. 3.
 USDA Looks at Information Needs for New Conservation Law. Nov., p. 3.
 USDA to Join "Take Pride in America" Campaign. Aug., p. 10.
 Welcome Aboard, FOCAS (N.C.). Archibald Hudgins, Dec., p. 4.
 Wetland Symposium To Be Held. Apr., p. 6.
 Who Uses No-Till, Who Doesn't, and Why. Barbara Osgood, Apr., p. 3.
 Women's Association Wins National Conservation Award (Mass.). Aug., p. 10.

New Publications

A Citizen's Handbook on Groundwater Protection. Wendy Gordon, Aug., p. 12.
 Agricultural Cooperatives—Their Why and Their How. Mar., p. 12.
 Agricultural Topics for Science Fair Projects. John Maday, May, p. 12.
 Anatomy of a Park: The Essentials of Recreation Area Planning and Design. Donald Molnar, July, p. 12.
 Baybook: A Guide to Reducing Water Pollution at Home. May, p. 12.
 Competition for Land in the American South. Robert Healy, Aug., p. 12.
 Conservation Districts into the 1990's. Nov., p. 12.

Conservation Planning—You and Your Land. Sept., p. 12.
 Conserving Soil: Insights From Socioeconomic Research. Oct., p. 12.
 Cost Data for Landscape Construction, 1986. Kerr Associates, Inc., July, p. 12.
 Cycles of Soil. Frank Stevenson, Oct., p. 12.
 Encyclopedia of Community Planning and Environmental Management. Marilyn Schultz and Vivian Kasen, July, p. 12.
 Engineering Models for Agricultural Production. Donnell Hunt, May, p. 12.
 Environmental Control for Agricultural Buildings. Merle Esmay and John Dixon, Sept., p. 12.
 Erosion and Sediment Control Handbook. Steven Goldman, Katharine Jackson, and Taras Burzstynsky, July, p. 12.
 Fertilizer Technology and Use. Sept., p. 12.
 Field Measurement of Dinitrogen Fixation and Denitrification. Sept., p. 12.
 Grass and Legume Seed Production in Montana and Wyoming. Larry Holzworth and Loren Wiesner, Apr., p. 12.
 Hazardous Waste Management: Reducing the Risk. Benjamin Goldman, James Hulme, and Cameron Johnson, Nov., p. 12.
 Interaction of Soil Minerals with Natural Organics and Microbes. Nov., p. 12.
 Lands of Brighter Destiny: The Public Lands of the American West. Elizabeth Darby Junkin, Nov., p. 12.
 Methods of Teaching Agriculture. L.H. Newcomb, J. David McCracken, and J. Robert Warmbrod, Sept., p. 12.
 Mineral Classification of Soils. Oct., p. 12.
 Minnesota Agriculture. Mar., p. 12.
 National Range Conference Proceedings. Apr., p. 12.
 North American Range Plants. J. Stubbendieck, Stephan Hatch, and Kathie Hirsch, July, p. 12.
 Pesticide Resistance: Strategies and Tactics for Management. Sept., p. 12.
 Planning a Community Center. July, p. 12.
 Potassium in Agriculture. Oct., p. 12.

Principles and Applications of Hydrochemistry. Erik Eriksson, Apr., p. 12.
 Range Economics. John Workman, Aug., p. 12.
 Research for Tomorrow, 1986 Yearbook of Agriculture. Jan., p. 12.
 Robots of Cave Alpha: Creating a Livable Land. Nov., p. 12.
 Soil Erosion and Crop Productivity. Apr., p. 12.
 Soil Salinity Under Irrigation: Processes and Management. Apr., p. 12.
 The Environment, Public Health, and Human Ecology: Considerations for Economic Development. James Lee, May, p. 12.
 The Off-Site Costs of Soil Erosion. Aug., p. 12.
 Toward a More Sustainable Agriculture. Raymond Poincelot, Oct., p. 12.
 TVA Launches Journal. July, p. 10.
 U.S. Agriculture in a Global Economy, 1985 Yearbook of Agriculture. Aug., p. 12.
 Warm-Season Grasses: Balancing Forage Programs in the Northeast and Southern Corn Belt. May, p. 12.

People

Comments From the SCS Chief. Volunteers—An Invaluable Resource. July, p. 2.
 Iowa Farm Group Volunteers to Help Farmers Sign Up for Conservation. Jody Christiansen, July, p. 3.
 New England States Strengthen Volunteer Program. July, p. 3.
 Soil Researcher Receives Bennett Award. Jan., p. 11.
 Speaking Tips for Volunteers. July, p. 3.

Plant Materials

Comments From the SCS Chief. Plant Materials Centers—Keys to Conservation's Future. Mar., p. 2.
 Good News on Eastern Gamagrass (Kans.). John Nicholson, Mar., p. 8.
 Native Prairie Grasses Take a Stand (Mo.). Richard Brown, Mar., p. 6.

Moving?

Send present mailing label and
new address including zip code to:

U.S. Department of Agriculture
Soil Conservation Service
P.O. Box 2890, Room 6202-S
Washington, DC 20013-2890

Official Business

Penalty for private use, \$300

THIRD-CLASS BULK RATE
POSTAGE AND FEES PAID
USDA-SCS
WASHINGTON DC
PERMIT NO. G-267

Nursery Operator Sows Grass,
Sets Example (Oreg.) Shirley
Boothby, Oct., p. 5.
Plant Release Fills Gap in Forage
Production (N.Y.) John
Dickerson and Martin van der
Grinten, Mar., p. 5.
Raising Livestock on Peanuts
(Fla.) Robert Glennon, Mar.,
p. 9.
SCS Computers to Locate Plant
Sources. Wayne Everett, Mar.,
p. 9.
SCS Is Looking for a Few Good
Plants. Curtis Sharp, Mar., p. 4.
SCS Searches Worldwide For
Conservation Plants. Jim Briggs
and Jerry Hammond, Mar., p. 3.
Seeds are Central to Conservation
Reserve (Tex.). James Alderson,
Mar., p. 8.

Range Management

Cattle Help Stamp Out Leafy
Spurge (Mont.) Mark Parman,
Nov., p. 8.
Coordinated Resource Manage-
ment Plan Helps Idaho Land-
owners. Gregory Painter, Aug.,
p. 5.

Recreation

Good Grounds for a Better Com-
munity Center (S.C.). David
White, July, p. 5.

Research

Computerized Crop Production
System. Aug., p. 11.
Daily Soil Frost Simulation Model.
Aug., p. 11.
Improved Seed Planter. Aug.,
p. 11.
Long-Term No-Till May Improve
Soil Structure. Apr., p. 11.
Night Light Curbs Hydrilla Repro-
duction. Aug., p. 11.
Researchers Study Rate of Straw
Decomposition Under
Conservation Tillage. Aug.,
p. 11.
Scientists Measure Iron Oxide to
Estimate Soil Age. Apr., p. 11.
Soil and Water Conservation Re-
search in Progress. May, p. 3.
Tillage Practice Affects Nitrogen
Loss in Soil. Apr., p. 11.

Soil(s)

SCS Warns of Cave-in Hazards
(Tex.). Dale Allen, Aug., p. 8.

Water Quality

Group Sponsors Water Resources
Law Symposium. Dec., p. 11.
Improved Irrigation Protects Water
Supply (N.Y.). Allan Connell and
Jean Krebs, Oct., p. 4.

SCS and EPA to Coordinate As-
sistance on Clean Lakes Proj-
ects. Aug., p. 10.
SCS Cosponsors Regional Meet-
ings on Agricultural Water
Quality. Aug., p. 10.

Water Supply

Comments From the SCS Chief.
Water Supply Forecasting Helps
Western Irrigators Save Money
and Water. Aug., p. 2.
Farmers Pool Resources, Survive
Drought (S.C.). Robert Bowie,
Dec., p. 11.
Financing a Rural Water Project
(Iowa). Dale Kraus, July, p. 4.
Illinois Takes New Approach to
Resource Planning. David
Moffitt, Nov., p. 6.
North Carolina Farmers Improve
Water Management. Aug., p. 6.
SCS Provides Western Water
Forecasts on Demand. Bernard
Shafer and Nadine Pitts. Aug.,
p. 3.
Town Is Mindful of Future Water
Needs (R.I.). Philip Morneault,
July, p. 4.

Wetland(s)

Comments From the SCS Chief. A
New Way to Protect Wetlands:
Swampbuster. Dec., p. 2.
Swampbuster—How It Affects Pro-
ducers. Diana Morse, Dec., p. 3.

USDA Issues Rules for Highly
Erodible Land and Converted
Wetlands. Sept., p. 10.
Wetland Symposium To Be Held.
Apr., p. 6.

Wildlife

Birds, Bees, and Other Wildlife
(Ind.). Wayne Machan, July, p. 8.
Ducks by the Mcbucket (N.C.).
Larry Petrovick, May, p. 7.
Improved Wildlife Habitat Spurs
New Business (Del.). Katherine
Gugulis, May, p. 10.
Indiana Study Shows Birds Prefer
No-Till. James McCall, May, p. 9.
SCS and Wildlife Heritage Team
Up for Waterfowl (Md.).
Katherine Gugulis, May, p. 11.
Reinvest in Minnesota. Dec., p. 9.
Rhode Island Farm Produces Wild-
life. Eric Scherer, May, p. 10.
Wisconsin Launches Wildlife En-
richment Program. Renae
Anderson and Thomas Thrall,
May, p. 8.

Windbreaks

Miniatures Help with Shelterbelt
Planning (Minn.). July, p. 11.
Symposium Stresses Multiple Ben-
efits of Windbreaks. Sept., p. 10.

New Publications

Agricultural Cooperatives— Their Why and Their How

by Glynn McBride

The economic rationale for the
existence of the cooperative form
of corporation is discussed in this
book. The principles and concepts
of farm cooperatives are presented
in two parts. In the first part, the
author provides a detailed discus-
sion of the economic theory that

supports the cooperative form of
corporation. The discussion covers
an analysis of the environment
within which cooperatives must
function, including markets and
competition, structure of satellite
industries, critical legislation, and
the structure of agriculture in the
economic system.

The second part focuses on how
cooperatives function and the inner
mechanics of organization neces-
sary for success. Coverage in-
cludes such subjects as the
principles of cooperative business,
basic decisionmaking in starting a
cooperative, management tech-
niques, financial resources, legal
considerations, Federal commodity
marketing orders, market pools,

and leadership within the cooper-
ative membership.

While written specifically for use
in agricultural economics, agri-
cultural marketing, and agri-
business undergraduate programs,
others in the food production and
distribution system will find valu-
able material throughout the book.

Copies of the 350-page book
are available for \$42.50 from AVI
Publishing Co., 250 Post Road
East, P.O. Box 831, Westport,
Conn. 06881.

Minnesota Agriculture

Minnesota Ag in the Classroom
has kicked off a major educational
effort with the introduction of a
new magazine called *Minnesota
Agriculture*.

Targeted to sixth-grade readers,
this magazine is designed to help
students learn more about the
source of their food supply and the
role of agriculture in the economy
and society. It is designed to be
easily integrated into a number of
subject areas.

Minnesota Agriculture will be
published four times during the
school year and distributed
through elementary and middle
school principals.